

GenCore version 5.1.3  
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OM nucleic - nucleic search, using sw model

Run on: February 16, 2003, 15:49:44 : Search time 215.022 Seconds  
(without alignments)  
14704.597 Million cell updates/sec

Title: US-09-497-967-5

Perfect score: 1404

Sequence: 1 atgaagaacaacatccctggt.....tgatctcttactacctgctg 1404

Scoring table: IDENTITY\_NUC  
Gapop 10.0 , Gapext 1.0

Searched: 2185239 seqs, 1125999159 residues

Total number of hits satisfying chosen parameters: 4370478

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%  
Maximum Match 100%  
Listing first 45 summaries

Database :

N: Geneseq\_101002.\*  
1: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA1980.DAT.\*  
2: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA1981.DAT.\*  
3: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA1982.DAT.\*  
4: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA1983.DAT.\*  
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22: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA2001A.DAT.\*  
23: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA2001B.DAT.\*  
24: /SIDS2/gcgdata/geneseq/geneseq-emb1/NA2002.DAT.\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	1404	100.0	1404	21	AAA97040
2	1404	100.0	1410	21	AAA97089
3	1400.8	99.8	1404	21	AAA97065
4	782.6	55.7	1404	21	AAA97038
5	782.6	55.7	1404	21	AAA52136
6	782.6	55.7	1410	21	AAA97060
7	138	9.8	138	21	AAA97075
8	123	8.8	123	21	AAA97076
9	105	7.5	117	21	AAA97071

C	10	104	7.4	104	21	AAA97072	G5 synthetic gene
	11	100	7.1	100	21	AAA97073	G5 synthetic gene
C	12	100	7.1	100	21	AAA97080	G5 synthetic gene
C	13	99	6.8	95	21	AAA97077	G5 synthetic gene
C	14	95	6.8	95	21	AAA97074	G5 synthetic gene
C	15	95	6.8	95	21	AAA97078	G5 synthetic gene
C	16	95	6.8	95	21	AAA97083	G5 synthetic gene
	17	94	6.7	94	21	AAA97079	G5 synthetic gene
	18	94	6.7	94	21	AAA97085	G5 synthetic gene
C	19	92	6.6	92	21	AAA97084	G5 synthetic gene
C	20	92	6.6	92	21	AAA97086	G5 synthetic gene
C	21	92	6.6	92	21	AAA97087	G5 synthetic gene
C	22	90	6.4	90	21	AAA97082	G5 synthetic gene
C	23	89	6.3	89	21	AAA97081	G5 synthetic gene
C	24	80	5.7	95	21	AAA97088	G5 synthetic gene
	25	63.2	4.5	1326	21	AAA97036	G5 synthetic gene
	26	63.2	4.5	2486	21	AAA97037	G5 synthetic gene
	27	63.2	4.5	2811	21	AAA52134	Nucleotide sequenc
	28	61.6	4.4	1326	21	AAA52135	pBIC3 construct c
	29	38.2	2.7	34980	22	AAH68528	48 kDa i-antigen g
	30	38.2	2.7	4403765	22	AAI99683	C glutamicum codin
C	31	38.2	2.7	4411529	22	AAI99682	Mycobacterium tube
C	32	37.4	2.6	18609	22	AAS21769	Mycobacterium tube
C	33	37.2	2.6	3946	18	AAT93610	Human gene for col
C	34	37	2.6	785	23	ABL28537	Mycobacterium tube
C	35	37	2.6	1829	23	ABL28536	Drosophila melanog
	36	36.2	2.6	913	18	ATG91476	Drosophila melanog
	37	36.2	2.6	913	18	ATG91413	Mycobacterium tube
	38	36.2	2.6	913	19	AAV64462	Mycobacterium tube
	39	36.2	2.6	913	19	AAV44354	M. tuberculosis im
	40	36.2	2.6	913	20	AAZ19264	M. tuberculosis an
C	41	36.2	2.6	913	20	AAZ19052	M. tuberculosis re
C	42	35.8	2.5	1954	21	AAC44830	Arabidopsis thalia
C	43	35.8	2.5	2017	21	AAZ56972	Arabidopsis pyruva
C	44	35.8	2.5	2413	19	AAV41361	Chlamydomonas rein
C	45	35.4	2.5	4863	22	AAK52286	Human polynucleoti

#### ALIGNMENTS

RESULT 1  
AAA97040  
ID AAA97040 standard; DNA; 1404 BP.  
AC AAA97040;  
XX  
XX  
DT 18-DEC-2000 (first entry)  
XX  
DE 55kd i-antigen synthetic gene.  
XX  
XX  
KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine; ds;  
KW white spot disease; freshwater fish; immune response; infection control.  
XX  
XX  
OS Ichthyophthirius multifiliis.  
OS Synthetic.  
XX  
XX  
PN WO200046373-A1.  
XX  
XX  
PD 10-AUG-2000.  
XX  
XX  
PF 04-FEB-2000; 2000WO-US02962.  
XX  
XX  
PR 04-FEB-1999; 99US-0118634.  
PR 02-MAR-1999; 99US-0122372.  
PR 17-MAR-1999; 99US-0124905.  
PR 27-APR-1999; 99US-0131121.  
XX  
XX  
PA (UYGE-) UNIV GEORGIA RES FOUND INC.  
PA (CORR) CORNELL RES FOUND INC.  
PA (CLAR/) CLARK T G.  
PA (DICK/) DICKERSON H W.  
PA (LINT/) LINT T.

XX Clark TG, Dickerson HW, Lin T;  
PI WPI; 2000-506071/45.  
XX Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
XX multililiis, useful for prophylaxis and treatment of Ichthyophthirius  
XX Infection in fish -  
XX PT  
XX PT  
XX Claim 5; Page 102; 144pp; English.  
XX This invention relates to novel i-antigen polypeptide sequences.  
XX I-antigens or immunisation antigens are common to a variety of  
XX hymenostomid ciliates and their expression varies in response to  
XX environmental stimuli. This invention relates to i-antigens in  
XX Ichthyophthirius multililiis, a protozoan which is an obligate parasite  
XX of freshwater fish causing ichthyophthiriasis or white spot disease. The  
XX invention includes two polypeptide and polynucleotide sequences for two  
XX i-antigens, of 48 and 55 kD. Also included in the invention are  
XX antibodies capable of binding to the nucleotide sequences and a method  
XX for identifying I. multililiis serotypes using the nucleotide sequences.  
XX A composition (containing the i-antigen nucleotide) capable of eliciting  
XX an immune response in fish is useful for prophylaxis, treatment or for  
XX controlling I. multililiis infection in fish. Polynucleotide or protein  
XX vaccines comprising a portion of the amplified product encoding an  
XX antigenic i-antigen polypeptide obtained is also useful for treating or  
XX preventing I. multililiis infection in fish. Sequences AAA97036-A97042,  
XX and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
XX fragments identified in the invention. Sequences AAA97043-A97064  
XX (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
XX isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
XX AAB25893-B25906 represent i-antigen protein and peptide sequences.  
XX Sequence 1404 BP; 317 A; 418 C; 339 G; 330 T; 0 other;  
SQ  
Query Match 100.0%; Score 1404; DB 21; Length 1404;  
Best Local Similarity 100.0%; Pred. No. 0;  
Matches 1404; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 1 ATGAAGAACAACATCCTGGTATCCTGATCATCTCTGTGTATCAACAGATCAAGTCT 60  
DB 1 ATGAAGAACAACATCCTGGTATCCTGATCATCTCTGTGTATCAACAGATCAAGTCT 60  
QY 61 GCTAACTGCTGTGGAGAACGACCAACACCGCTGCAGAGGTGGACGACCTGGGAACC 120  
DB 61 GCTAACTGCTGTGGAGAACGACCAACACCGCTGCAGAGGTGGAGGACCTGGGAACC 120  
QY 121 CCTGCTAACTGTGTGAAGTGTGAGAGAACTTCTACTACAACACGCTGCTGTTTCGTG 180  
DB 121 CCTGCTAACTGTGTGAAGTGTGAGAGAACTTCTACTACAACACGCTGCTGTTTCGTG 180  
QY 181 CCTGGAGCTTCTACCTGTACCCCTTGCTCAGAGAGGAGCGTGGAGCTCAGCCTAAC 240  
DB 181 CCTGGAGCTTCTACCTGTACCCCTTGCTCAGAGAGGAGCGTGGAGCTCAGCCTAAC 240  
QY 241 CCTCTGCTACCGCTAACTGTGTACCCAGTAACTGAGTGTCTGTGTGGAACCGCT 300  
DB 241 CCTCTGCTACCGCTAACTGTGTACCCAGTAACTGAGTGTCTGTGTGGAACCGCT 300  
QY 301 ATCGCTGGAGGAGCTACCGACTACCGCTGCTATCATCACCAGTGTGTGAACTGTCGCATC 360  
DB 301 ATCGCTGGAGGAGCTACCGACTACCGCTGCTATCATCACCAGTGTGTGAACTGTCGCATC 360  
QY 361 AACTTCTACAAGAGAACGCTCCTAACTCAACGCTGGAGCTTCTACTGTACCGCTTGT 420  
DB 361 AACTTCTACAAGAGAACGCTCCTAACTCAACGCTGGAGCTTCTACTGTACCGCTTGT 420  
QY 421 CCTGTGAACCGGCTGGAGAGGCTCTGACCGCTGAAACGCTGTACCATGTGCTCAG 480  
DB 421 CCTGTGAACCGGCTGGAGAGGCTCTGACCGCTGAAACGCTGTACCATGTGCTCAG 480  
QY 481 TGTAACTGGCTGTGCTCCTACCGGAACCGCTCTGGACGACGAGTGTACCCAGCTACGTG 540  
DB 481 TGTAACTGGCTGTGCTCCTACCGGAACCGCTCTGGACGACGAGTGTACCCAGCTACGTG 540

DB 481 TGTAACTGGCTGTGCTCCTACCGGAACCGCTCTGGACGACGAGTGTACCCAGCTACGTG 540  
QY 541 CGCTCTTTACCGAGTGTGAAGTGTGCCTGAACCTTCTACTACAACGAAACACGGA 600  
DB 541 CGCTCTTTACCGAGTGTGAAGTGTGCCTGAACCTTCTACTACAACGAAACACGGA 600  
QY 601 AACACCCCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTGTCTCTGTATCAAGCCTGCT 660  
DB 601 AACACCCCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTGTCTCTGTATCAAGCCTGCT 660  
QY 661 AACGTGGCTCAGGCTACCCCTGGGAAACGAGCTACCATCAGCTACCGCTCAGTGTAACTGGCT 720  
DB 661 AACGTGGCTCAGGCTACCCCTGGGAAACGAGCTACCATCAGCTCAGTGTAACTGGCT 720  
QY 721 TGTCTTGACGGAGAACATCTCTCTGCTGGAGTGAACAACTGGTGGCTCAGAACACCGAG 780  
DB 721 TGTCTTGACGGAGAACATCTCTCTGCTGGAGTGAACAACTGGTGGCTCAGAACACCGAG 780  
QY 781 TGTACCAACTGTGCTCTAACTTCTTACAACAAACGCTTCTTAACCTCAACCCCTGGAAC 840  
DB 781 TGTACCAACTGTGCTCTAACTTCTTACAACAAACGCTTCTTAACCTCAACCCCTGGAAC 840  
QY 841 TCTACCTGTGCTCTGCTTGTCTCTTAACTTCTTACAACAAACGCTTCTTAACCTCAACCCCTGGAAC 900  
DB 841 TCTACCTGTGCTCTGCTTGTCTCTTAACTTCTTACAACAAACGCTTCTTAACCTCAACCCCTGGAAC 900  
QY 901 GCTGCTACCCCTGGCTAAGCAGTGTAACTGCTTGTCTGACGGAACCGCTATCCCTTCT 960  
DB 901 GCTGCTACCCCTGGCTAAGCAGTGTAACTGCTTGTCTGACGGAACCGCTATCCCTTCT 960  
QY 961 GGAGCTACCAACTACGTGATCTCTGCTGACGAGCGGTCTGAACCTGTGCTGCTTCTAC 1020  
DB 961 GGAGCTACCAACTACGTGATCTCTGCTGACGAGCGGTCTGAACCTGTGCTGCTTCTAC 1020  
QY 1021 TTTGACGGAACAACTTCCAGGCTGATCTTCTGCTGTGAAGCTTGTCTCTTCTAACAG 1080  
DB 1021 TTTGACGGAACAACTTCCAGGCTGATCTTCTGCTGTGAAGCTTGTCTCTTCTAACAG 1080  
QY 1081 GTGAGGAGCTGTGGCTACCGCTGGAGAACCGCTACCTGATCGCTCAGTGTGCTCTG 1140  
DB 1081 GTGAGGAGCTGTGGCTACCGCTGGAGAACCGCTACCTGATCGCTCAGTGTGCTCTG 1140  
QY 1141 GAGTGTCTGCTGGAACCGCTGTGCTGACCGAGGAAACCACTTCTACCTTACAGCAGGCTGCT 1200  
DB 1141 GAGTGTCTGCTGGAACCGCTGTGCTGACCGAGGAAACCACTTCTACCTTACAGCAGGCTGCT 1200  
QY 1201 TCTGAGTGTGGAAGTGTGCTTAACTTCTACACCAACGAGCAGCGACTGGTGGCT 1260  
DB 1201 TCTGAGTGTGGAAGTGTGCTTAACTTCTACACCAACGAGCAGCGACTGGTGGCT 1260  
QY 1261 GGAATCGACACTGTACCTCTTGTAAACAAAGCTGACCTCTGAGCTGAGGCTAACCTG 1320  
DB 1261 GGAATCGACACTGTACCTCTTGTAAACAAAGCTGACCTCTGAGCTGAGGCTAACCTG 1320  
QY 1321 CCTGAGTGTCTGAAGAAGACATCCAGTGTGACTTCCGTAACTTCTCTCTCTCTCTG 1380  
DB 1321 CCTGAGTGTCTGAAGAAGACATCCAGTGTGACTTCCGTAACTTCTCTCTCTCTG 1380  
QY 1381 CTGCTGATCTTCTTACTACTCTGCTG 1404  
DB 1381 CTGCTGATCTTCTTACTACTCTGCTG 1404  
RESULT 2  
AAA97089  
ID AAA97089 standard; DNA; 1410 BP.  
XX  
AC AAA97089;  
XX  
DT 18-DEC-2000 (first entry)  
XX  
DE Synthetic I. Multililiis G5 isolate i-antigen gene.  
XX

Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine; ds;  
white spot disease; freshwater fish; immune response; infection control.  
Synthetic.

Ichthyophthirius multifiliis.

WO200046373-A1.

10-AUG-2000.

04-FEB-2000; 2000WO-US02962.

04-FEB-1999; 99US-0118634.

02-MAR-1999; 99US-0122372.

17-MAR-1999; 99US-0124905.

27-APR-1999; 99US-0131121.

(UYGE-) UNIV GEORGIA RES FOUND INC.

(CORR.) CORNELL RES FOUND INC.

(CLARK/) CLARK T G.

(DICK/) DICKERSON H W.

(LIN/) LIN T.

Clark TG, Dickerson HW, Lin T;

WPI; 2000-506071/45.

Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius multifiliis, useful for prophylaxis and treatment of Ichthyophthirius infection in fish -

Example 5; Figure 2b; 144pp; English.

This invention relates to novel i-antigen polypeptide sequences. I-antigens or immobilisation antigens are common to a variety of hymenostomatid ciliates and their expression varies in response to environmental stimuli. This invention relates to i-antigens in Ichthyophthirius multifiliis, a protozoan which is an obligate parasite of freshwater fish causing ichthyophthiriasis or white spot disease. The invention includes two polypeptide and polynucleotide sequences for two i-antigens, of 48 and 55 kb. Also included in the invention are antibodies capable of binding to the nucleotide sequences and a method for identifying I. multifiliis serotypes using the nucleotide sequences. A composition (containing the i-antigen nucleotide) capable of eliciting an immune response in fish is useful for prophylaxis, treatment or for controlling I. multifiliis infection in fish. Polynucleotide or protein vaccines comprising a portion of the amplified product encoding an antigenic i-antigen polypeptide obtained is also useful for treating or preventing I. multifiliis infection in fish. Sequences AAA97036-A97042, and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene fragments identified in the invention. Sequences AAA97043-A97064 (excluding AAA97060) and AAA97071-A97088 represent primers used in the isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and AAB25893-B25906 represent i-antigen protein and peptide sequences.

Sequence 1410 BP: 321 A; 418 C; 339 G; 332 T; 0 other;

Query Match 100.0%; Score 1404; DB 21; Length 1410;  
Best Local Similarity 100.0%; Pred. No. 0;  
Matches 1404; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Qy 1 ATGAAGAACACATCCCTGGTGATCATCTCTGTTCATCAACAGATCAAGTCT 60

1 ATGAAGAACACATCCCTGGTGATCATCTCTGTTCATCAACAGATCAAGTCT 60

61 GCTAACTGTCCTGTGGAAACCGAGACCAACCGCTGGACAGTGGGGAACC 120

61 GCTAACTGTCCTGTGGAAACCGAGACCAACCGCTGGACAGTGGGGAACC 120

121 CCTGCTAACTGTCGTAAGTGTCTGAGAGAACTTCTACTACAAACAGCTGCTCTTCGTG 180

121 CCTGCTAACTGTCGTAAGTGTCTGAGAGAACTTCTACTACAAACAGCTGCTCTTCGTG 180

Qy 181 CCTGGAGCTTCTACCTGTACCTCCCTTGTCTCAGAAAGACGCTGGAGCTCAGCCTAAC 240  
Db 181 CCTGGAGCTTCTACCTGTACCTCCCTTGTCTCAGAAAGACGCTGGAGCTCAGCCTAAC 240  
Qy 241 CCTCCTGCTACCCGCTAACCTGTGAGCCAGTGTAAAGTGTCTGCTGCTGCTGCTGCT 300  
Db 241 CCTCCTGCTACCCGCTAACCTGTGAGCCAGTGTAAAGTGTCTGCTGCTGCTGCTGCT 300  
Qy 301 ATCGCTGGAGGAGCTACCGACTACGCTGTATCATCACCAGAGTGTGTAACCTGTGCTGCT 360  
Db 301 ATCGCTGGAGGAGCTACCGACTACGCTGTATCATCACCAGAGTGTGTAACCTGTGCTGCT 360  
Qy 361 AACTTCTACAAAGAGAACGCTCCTAACTTCAACGCTGGAGCTTCTACCTGTACCGCTTGT 420  
Db 361 AACTTCTACAAAGAGAACGCTCCTAACTTCAACGCTGGAGCTTCTACCTGTACCGCTTGT 420  
Qy 421 CCTGTGAACCGCTGGGAGGAGCTCTGACCGCTGGAACGCTGCTACCATCGTGGCTCAG 480  
Db 421 CCTGTGAACCGCTGGGAGGAGCTCTGACCGCTGGAACGCTGCTACCATCGTGGCTCAG 480  
Qy 481 TGTAACTGGCTTGTCTTACCGGAAACCGCTCTGGAGACGAGTGCACCACTAGCTAGTG 540  
Db 481 TGTAACTGGCTTGTCTTACCGGAAACCGCTCTGGAGACGAGTGCACCACTAGCTAGTG 540  
Qy 541 CGCTCTTTCACCGAGTGTGTGAAGTGTGCTGCTGAACTTCTACTACAACGGAACACGGA 600  
Db 541 CGCTCTTTCACCGAGTGTGTGAAGTGTGCTGCTGAACTTCTACTACAACGGAACACGGA 600  
Qy 601 AACACCCCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTCTCCTGCTATCAACGCTTGT 660  
Db 601 AACACCCCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTCTCCTGCTATCAACGCTTGT 660  
Qy 661 AACGCTGGCTAGGCTTACCTGGGAAACGCTACCATCAACGCTCAGTGTAAAGCTGGCT 720  
Db 661 AACGCTGGCTAGGCTTACCTGGGAAACGCTACCATCAACGCTCAGTGTAAAGCTGGCT 720  
Qy 721 TGTCTCTGACGGAACCATCTCTGCTGCTGGAGTGAACAACTGGGTGGCTCAGAACACGAG 780  
Db 721 TGTCTCTGACGGAACCATCTCTGCTGCTGGAGTGAACAACTGGGTGGCTCAGAACACGAG 780  
Qy 781 TGTACCAACTGTGCTCTTAACTTCTACAACAAACGCTCTCAACTTCAACCCCTGGAAAC 840  
Db 781 TGTACCAACTGTGCTCTTAACTTCTACAACAAACGCTCTCAACTTCAACCCCTGGAAAC 840  
Qy 841 TCTACCTGTCTGCTCTTGTCTGCTTAAAGAGCTACGAGCTCAGGCTACCGCTGGAGGA 900  
Db 841 TCTACCTGTCTGCTCTTGTCTGCTTAAAGAGCTACGAGCTCAGGCTACCGCTGGAGGA 900  
Qy 901 GCTGTACCCCTGGCTTAAAGAGCTTAAACATCGCTTGTCTCAGGAAACCGCTATCGCTTCT 960  
Db 901 GCTGTACCCCTGGCTTAAAGAGCTTAAACATCGCTTGTCTCAGGAAACCGCTATCGCTTCT 960  
Qy 961 GGAGCTACCAACTACGCTGATCCTGCAGACGAGTGTCTGAACCTGTGCTGCTAACTTCTAC 1020  
Db 961 GGAGCTACCAACTACGCTGATCCTGCAGACGAGTGTCTGAACCTGTGCTGCTAACTTCTAC 1020  
Qy 1021 TTCACGGAACAACTTCCAGGCTGGATCTTCTCGCTGTAAAGCTTGTCTGCTAAACAAG 1080  
Db 1021 TTCACGGAACAACTTCCAGGCTGGATCTTCTCGCTGTAAAGCTTGTCTGCTAAACAAG 1080  
Qy 1081 GTGAGGAGCTGTGGCTACCGCTGGAGGAAACCGCTACCTGTATCGCTCAGTGTGCTCTG 1140  
Db 1081 GTGAGGAGCTGTGGCTACCGCTGGAGGAAACCGCTACCTGTATCGCTCAGTGTGCTCTG 1140  
Qy 1141 GAGTGTCTCTGGAACCGCTGCTGACCGAGGAAACCACTCTACCTTACAAGAGGCTGCT 1200  
Db 1141 GAGTGTCTCTGGAACCGCTGCTGACCGAGGAAACCACTCTACCTTACAAGAGGCTGCT 1200  
Qy 1201 TCTGAGTGTGTGAAGTGTGCTGCTAACTTCTACACCAACCAACGAGCTGGGTGGCT 1260  
Db 1201 TCTGAGTGTGTGAAGTGTGCTGCTAACTTCTACACCAACCAACGAGCTGGGTGGCT 1260  
Qy 1261 GGAATGACACCTGTACCTCTTGTAAAGAGCTGACCTCTGGAGCTGAGGCTAACCTG 1320

Db 1261 GGAATCGACACCTGTACCTTGTAAACAAGAGCTGACCTCTGGAGCTGAGGCTAACCTG 1320  
QY 1321 CCGTAGTCTGCTAAGAAGACATCCAGTGTGACTTCGCTAACTTCCTGTCTATCTCTCTG 1380  
Db 1321 CCGTAGTCTGCTAAGAAGACATCCAGTGTGACTTCGCTAACTTCCTGTCTATCTCTCTG 1380  
QY 1381 CTGCTGATCTTACTACTGCTG 1404  
Db 1381 CTGCTGATCTTACTACTGCTG 1404  
RESULT 3  
AAA97065  
ID AAA97065 standard; DNA; 1404 BP.  
XX AC AAA97065;  
XX 18-DEC-2000 (first entry)  
XX Synthetic 55kD i-antigen gene sequence.  
DE Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine; ds;  
XX white spot disease; freshwater fish; immune response; infection control.  
KW Ichthyophthirius multifiliis.  
XX Synthetic.  
OS WO200046373-A1.  
OS 10-AUG-2000.  
XX 04-FEB-2000; 2000WO-US02962.  
XX 04-FEB-1999; 99US-0118634.  
PR 02-MAR-1999; 99US-0122372.  
PR 17-MAR-1999; 99US-0124905.  
PR 27-APR-1999; 99US-0131121.  
XX (UYGE-) UNIV GEORGIA RES FOUND INC.  
PA (CORR ) CORNELL RES FOUND INC.  
PA (CLAR/) CLARK T G.  
PA (DICK/) DICKERSON H W.  
PA (LINT/) LIN T.  
XX Clark TG, Dickerson HW, Lin T;  
PI WPI; 2000-0506071/45.  
DR  
XX Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
PT multifiliis, useful for prophylaxis and treatment of ichthyophthirius  
PT infection in fish .  
XX  
PS Example 5; Figure 13; 144pp; English.  
XX  
XX This invention relates to novel i-antigen polypeptide sequences.  
CC I-antigens or immobilisation antigens are common to a variety of  
CC hymenostomatid ciliates and their expression varies in response to  
CC environmental stimuli. This invention relates to i-antigens in  
CC Ichthyophthirius multifiliis, a protozoan which is an obligate parasite  
CC of freshwater fish causing ichthyophthiriasis or white spot disease. The  
CC invention includes two polypeptide and polynucleotide sequences for two  
CC i-antigens, of 48 and 55 kb. Also included in the invention are  
CC antibodies capable of binding to the nucleotide sequences and a method  
CC for identifying I. multifiliis serotypes using the nucleotide sequences.  
CC A composition (containing the i-antigen nucleotide) capable of eliciting  
CC an immune response in fish is useful for prophylaxis, treatment or for  
CC controlling I. multifiliis infection in fish. Polynucleotide or protein  
CC vaccines comprising a portion of the amplified product encoding an  
CC antigenic i-antigen polypeptide obtained is also useful for treating or  
CC preventing I. multifiliis infection in fish. Sequences AAA97036-A97042,  
CC and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
CC fragments identified in the invention. Sequences AAA97043-A97064

CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
XX  
SQ Sequence 1404 BP; 317 A; 418 C; 339 G; 330 T; 0 other;  
Query Match 99.8%; Score 1400.8; DB 21; Length 1404;  
Best Local Similarity 99.9%; Pred. No. 0;  
Matches 1402; Conservative 0; Mismatches 2; Indels 0; Gaps 0;  
QY 1 ATGAAGAACACATCCTGGTGTATCTCTGATCATCTCTCTGTTCATCAACACAGATCAAGTCT 60  
Db 1 ATGAAGAACACATCCTGGTGTATCTCTGATCATCTCTCTGTTCATCAACACAGATCAAGTCT 60  
QY 61 GCTAACTGTCTGTGGAAACGAGACCAACACCGCTGGACAGGTGGACGACCTGGGAACC 120  
Db 61 GCTAACTGTCTGTGGAAACGAGACCAACACCGCTGGACAGGTGGACGACCTGGGAACC 120  
QY 121 CCTGTAACTGTGTGAAGTGTGAGAGAACTTCTACTACAACAACGCTGTGCTTTCGTG 180  
Db 121 CCTGTAACTGTGTGAAGTGTGAGAGAACTTCTACTACAACAACGCTGTGCTTTCGTG 180  
QY 181 CTGGAGCTTCTACCTGTACCCCTTGTCTCAGAAGAAGAGACGCTGGAGCTCAGCCTAAAC 240  
Db 181 CTGGAGCTTCTACCTGTACCCCTTGTCTCAGAAGAAGAGACGCTGGAGCTCAGCCTAAAC 240  
QY 241 CCTCTGTCTACCGCTAACCTGTGTGACCCAGTGTACGTGAAGTGTCTGTGTTGGACCGCT 300  
Db 241 CCTCTGTCTACCGCTAACCTGTGTGACCCAGTGTACGTGAAGTGTCTGTGTTGGACCGCT 300  
QY 301 ATCGCTGGAGGAGTACCGACTACGCTGTATCATCACCAGGTGTGTGAACCTGTGCGATC 360  
Db 301 ATCGCTGGAGGAGTACCGACTACGCTGTATCATCACCAGGTGTGTGAACCTGTGCGATC 360  
QY 361 AACTTCTACAACGAGAACGCTCTTAACCTTCAACGCTGGAGTCTTACCTGTACCGCTTGT 420  
Db 361 AACTTCTACAACGAGAACGCTCTTAACCTTCAACGCTGGAGTCTTACCTGTACCGCTTGT 420  
QY 421 CCGTGTGAACCGCTGGAGGAGCTCTGACCGCTGGAAACGCTGTACCATCTGCTGCTCAG 480  
Db 421 CCGTGTGAACCGCTGGAGGAGCTCTGACCGCTGGAAACGCTGTACCATCTGCTGCTCAG 480  
QY 481 TGTAAACGTGGCTTGTCTCTACCGGAACCGCTCTGGACGACGGAGTGACCAACGCTACGTG 540  
Db 481 TGTAAACGTGGCTTGTCTCTACCGGAACCGCTCTGGACGACGGAGTGACCAACGCTACGTG 540  
QY 541 CGCTCTTTTACCGAGTGTGAAGTGTGCGCTCAACTTCTACTACAACGGAACACACGGA 600  
Db 541 CGCTCTTTTACCGAGTGTGAAGTGTGCGCTCAACTTCTACTACAACGGAACACACGGA 600  
QY 601 AACACCCCTTTCAACCTGGAAAGTCTCAGTGTACCCCTTGTCTCTCTATCAAGCTGTCT 660  
Db 601 AACACCCCTTTCAACCTGGAAAGTCTCAGTGTACCCCTTGTCTCTCTATCAAGCTGTCT 660  
QY 661 AACGTGGCTCAGGCTACCCCTGGGAACGAGCTACCATCACCCCTCAGTGTACCGTGGCT 720  
Db 661 AACGTGGCTCAGGCTACCCCTGGGAACGAGCTACCATCACCCCTCAGTGTACCGTGGCT 720  
QY 721 TGTCTGTACGGAACCATCTCTGCTGTGGAGTGAACAACTGGGTGGCTCAGAACACCGAG 780  
Db 721 TGTCTGTACGGAACCATCTCTGCTGTGGAGTGAACAACTGGGTGGCTCAGAACACCGAG 780  
QY 781 TGTACCAACTGTGCTCTTAACCAACAACGCTCTTACTTCAACCCCTGGAAAC 840  
Db 781 TGTACCAACTGTGCTCTTAACCAACAACGCTCTTACTTCAACCCCTGGAAAC 840  
QY 841 TGTACTGTGCTCTTGTCTCTGTCTTAAACGAGCTACCGAGCTACCGTGGAGGA 900  
Db 841 TGTACTGTGCTCTTGTCTCTGTCTTAAACGAGCTACCGAGCTACCGTGGAGGA 900  
QY 901 GCTGTCTACCCCTGGCTTAACGAGCTGTAAATCGCTTGTCTGTACGGAACCGGTATCGCTTCT 960  
Db 901 GCTGTCTACCCCTGGCTTAACGAGCTGTAAATCGCTTGTCTGTACGGAACCGGTATCGCTTCT 960



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us-09-497-967-5.rng

Db	601	AACTACTCCTTTCAATCCAGGTAAGAAGTTAATGACACACCTTGTCCGGCAATTAACACCTGCT	660
Qy	661	AACTGGGCTCAGGCTACCCCTGGGAACACACCTACCATCACCCTCAGTCTAAGCTGGCT	720
Db	661	AACTGGTCTTAAGCTTACTTTAGTGAATGATGCTACAATAACCGCATATGTAAGCTTGGCA	720
Qy	721	TGTCCTGAGCGGACCATCTCTGCTCGAGTGAGCAACACTGGGTGGCTCAGAACACCGAG	780
Db	721	TGCGCTGATGGTACTATAAGTGCTGCTGGAGTAATAATGCGTAGCACAAACACTGAA	780
Qy	781	TGTACCAACTGTGCTCCTAACCTTACAAACACAGCGTCTCTAATCTCAACCCCTGGAAAC	840
Db	781	TGTACTAATTTGCTCCTCAACTTTTACAATAATATGCTCCTTAATTTCAATCCAGGTAAT	840
Qy	841	TCTACCTGTCTGCTGCTCTCTCTACAGAGACTACGAGCTGAGGCTACCGCTGGAGGA	900
Db	841	AGTACATGCTACTGCTGCGCCAGCAATAAAGATTAATGCTGTAAGCCACTGCAAGTGGT	900
Qy	901	GCTGCTACCTGCTGAAGCAGTGAACATGCTTCTCTGACGGAAACCGCTATCGCTTCT	960
Db	901	GCGCTACTTTAGCCAAATAATGTAATTTGCAATGCCCTGATGGTACTGCAATTGCTAGT	960
Qy	961	GGAGCTACCAACTACGTGATCTGACGACCGAGTGTCTGAACCTGCTGCTAACTTCTAC	1020
Db	961	GGAGCAACTAATTTATGTAATATTATAAACAGAAATGTCTAAATGTGCTGCTAACTTTAT	1020
Qy	1021	TTCCAGCGGAACAACCTTCCAGGCTGATCTTCTCGCTGTAAGGCTTGTCTCTGCTAACAAAG	1080
Db	1021	TTTGATGGTAATAATTTCTAGCGCAGAAGTAGTAGATGCAAGCATGCTCCAGCAATAAA	1080
Qy	1081	GTGCGAGGAGCTTGGCTACCGCTGGAGGAACCGGTACCCCTGATCGCTCAGTGTGCTCTG	1140
Db	1081	GTTTAAGGCGCTGTAGCAACTGCAGGTGGTACTGCTACTTTTAATGCAATAATGTGCCCTT	1140
Qy	1141	GAGTGTCTCTGGAACCGCTGCTGACGCGGAACACACCTCTACCTACAAAGCAGGCTGCT	1200
Db	1141	GAATGCGCTCTGCTGCTACTGTACTACCGGATGGAACAAACATCTATTATAAATAGCAGCA	1200
Qy	1201	TCTCAGTGTGTGAAGTGTGCTGCTAACTTCTACACCAACCAAGCAGCAGCTGGGTGGCT	1260
Db	1201	TCTGAATGTGTAAATGTCTGCTGCAACTTTTATACAAAATAAACTGATTTGGGTAGCA	1260
Qy	1261	GGAATCGACACCTGTACTCTTGTAAACAGACTGACCTCTGGAGCTGAGGCTAACCTG	1320
Db	1261	GGTATTGATACATGTACTAGTTGTATAAAAAAATAAATTAACCTCTGGCGCTGAAGCTAATTTA	1320
Qy	1321	CCTGAGTCTGCTAAGAGAACATCCAGTGTGACTTCGCTAACTTCCTGTCTATCTCTG	1380
Db	1321	CCTGAATCTGCTAAAAAATAATAATGATGATTCGCTAAATTTTTTATCAATTTCCCTTA	1380
Qy	1381	CTGCTGATCTCTACTA	1397
Db	1381	TTATTGATTTCTTATTA	1397
RESULT	5		
ID	AAA52136		
AC	AAA52136 standard; DNA; 1404 BP.		
XX	AAA52136;		
XX			
DT	04-DEC-2000 (first entry)		
XX			
DE	55 kda i-antigen gene.		
XX			
KW	BTU1; beta-tubulin; protein expression system; negative selection;		
KW	pacilitaxel sensitivity; cell surface; antigen; protozoa; ciliate;		
KW	live vaccine; Ichthyophthius multifiliis; immobilization-antigen;		
KW	i-antigen; freshwater; fish; protozoacide; ds.		
XX			
OS	Ichthyophthius multifiliis.		
XX			
Key	Location/Qualifiers		

FT	CDS	1..1404	
FT		/tag= a	
FT		/codon= (seq:"TAA", aa:Gln)	
FT		/product= 55_kDa_i-antigen	
FT		/partial	
XX			
PN	WO200046381-A1.		
XX			
PD	10-AUG-2000.		
XX			
PF	04-FEB-2000; 2000WO-US02966.		
XX			
PR	04-FEB-1999; 99US-0118634.		
PR	02-MAR-1999; 99US-0123372.		
PR	17-MAR-1999; 99US-0124905.		
XX	27-APR-1999; 99US-0131121.		
XX			
PA	(UYGE-) UNIV GEORGIA RES FOUND INC.		
PA	(GAER/) GAERTIG J.		
PA	(DICK/) DICKERSON H W.		
PA	(CLAR/) CLARK T G.		
XX			
PI	Gaertig J, Dickerson HW, Clark TG;		
XX			
DR	WPI: 2000-514962/46.		
DR	P-PSDB; AAY97177.		
XX			
XX	Recombinant expression systems for expressing heterologous nucleic acids and producing recombinant protein, comprises nonpathogenic protozoa such as Tetrahymena resistant to paclitaxel		
PS	Disclosure; Fig 3B; 83pp; English.		
XX			
CC	Tetrahymena thermophila expresses two major beta-tubulin genes (BTU1 and BTU2), which encode identical beta-tubulin proteins. Either of these two genes (but not both at once) can be disrupted without a detectable change in the cell phenotype. A K350L substitution in the BTU1 beta-tubulin protein confers increased resistance to microtubule-depolymerizing drugs and increased sensitivity to paclitaxel, a microtubule-stabilizing drug. Cells carrying the BTU1-K350M allele can be transformed to paclitaxel resistance by gene replacement of BTU1-K350M with a wild-type BTU1 gene fragment, eliminating the need to incorporate a means for positive selection. Where the host organism is not a T. thermophila mutant containing the BTU1-K350M allele, BTU1::neol construct, which substitutes the coding region of the neol gene (conferring resistance to paromycin) for that of BTU1, can be used to generate BTU1 gene knockouts and for positive selection. Heterologous nucleic acids (especially encoding antigenic polypeptides) can be inserted into a BTU gene for successful cell-surface expression that is maintained by way of negative selection. Preferred expression vectors disrupt the BTU1-K350M gene by homologous recombination-mediated insertion of a heterologous nucleic acid, thereby restoring resistance to paclitaxel in the resulting transgenic host. Transgenic ciliated protozoa are useful as live vaccines for stimulating an immune response in a vertebrate. The transgenic protozoan host cells are also useful for producing polyclonal antibodies (claimed). In particular, Tetrahymena expressing Ichthyophthius multifiliis immobilization-antigen (i-antigen) protein on their surface are effective vehicles for vaccination of freshwater fish against infection by I. multifiliis.		
XX			
SQ	Sequence 1404 BP; 447 A; 241 C; 256 G; 460 T; 0 other;		
Query Match		55.7%;	Score 782.6; DB 21; Length 1404;
Best Local Similarity		72.5%;	Pred. No. 1.4e-215;
Matches 1013; Conservative		0;	Mismatches 384; Indels 0; Gaps 0;
Qy	1	ATGAGAACACATCTCTGGTGCATCTGTATCTCTCTTCATCAACACAGATCAAGTCT	60
Db	1	ATGAAATAATATTTTGTAGTATATTTGATTTATTTCAATTAATTAATAATCT	60
Qy	61	GCTAACTGTCTGGGACCGAGACCAACACCTCGACAGGTGGACCTGGGAAC	120
Db	61	GCTAATGTCTGTGGAACTGAAACTAACACACCGGATGAAGTTGATGATCTAGGACT	120



antigenic i-antigen polypeptide obtained is also useful for treating or preventing I. multifiliis infection in fish. Sequences AA97036-AA97042, CC and AA97060, AA97065 and AA97089 represent i-antigen genes and gene fragments identified in the invention. Sequences AA97043-AA97064 (excluding AA97060) and AA97071-AA97088 represent primers used in the isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and CC AAB25893-B25906 represent i-antigen protein and peptide sequences.

XX	QY	1	ATGAAGAACCAATCCTGGTGATCGTATCAATCTCTCTGTTTCATCAACGAGTCAAGTCT	60
XX	DB	1	ATGAAATAATATTTAGTATATATGATTTATTCATTTATTAATTAATTAATTAATTA	60
XX	QY	61	GCTAACTGCTCTGGGACCGACACACCGCTGGACAGGTGGACGCTGGGAACC	120
XX	DB	61	GCTAAATGCTCTGGGAACTGAACTAACACAGCCGATAGTTGATGATCTAGGA	120
XX	QY	121	CTGCTAACTGCTGAAGTCTCAGAGAACTTCTACTACAAACGCTGCTGCTTCG	180
XX	DB	121	CTGCAAAATGCTGTAATGTTAGAAAACCTTTTATTAATAATGCTGCTGCTTCG	180
XX	QY	181	CTGGAGCTTCACTGTAACCTGCTCAGAGAGAGGAGCTGGAGCTCAGCCTAAC	240
XX	DB	181	CTGGTGTGCTAGTACGTTACACCTTGTCCATAAAAAAGATGCTGGTCTTAAC	240
XX	QY	241	CTCTCTGCTACCGCTAACCTGGTGACCCAGTCTAACTGGAAGTGTCTGCTGGA	300
XX	DB	241	CCACCTGCTACTGCTTAATTTAGTCACATAATGTAACGTTAATGCTGCTGTA	300
XX	QY	301	ATGCTGGAGGAGTACCGACTACGCTGCTATCATCAGGAGTGTGTAAGTGTG	360
XX	DB	301	ATTGCAAGTGGCAACAGATTATGCAAGCAATAATCAGAGAATGTTAAATGTA	360
XX	QY	361	AACCTTCTACAGAGACGCTCTCACTTCAAGCTGGAGCTTCTACCTGACCGCT	420
XX	DB	361	AATTTTATTAATGAAATGCTCCAAATTTTATGCAAGTGTCTAGTACATGCA	420
XX	QY	421	CCTGTGAACCGCTGGGAGAGCTCTGACCGCTGGAAACGCTGTACCATCTGCT	480
XX	DB	421	CCGTTAAACAGAGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	480
XX	QY	481	TGTAACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	540
XX	DB	481	TGTAACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	540
XX	QY	541	CGCTCTTTCACCGAGTGTGGAAGTGTGCTGCTGCTGCTGCTGCTGCTGCTG	600
XX	DB	541	AGATCATTCACAGATGTTTAAATGTAGACTTAACTTTTACTATTAATGTA	600
XX	QY	601	AACACCGCTTTCACCGTGAAGTCTCACTGCTGCTGCTGCTGCTGCTGCTG	660
XX	DB	601	AATACTCTTTCACCGTGAAGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	660
XX	QY	661	ACGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	720
XX	DB	661	ATGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	720
XX	QY	721	TGCTCTGACGGAACATCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	780
XX	DB	721	TGCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	780
XX	QY	781	TGTACCACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	840
XX	DB	781	TGTACTAATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	840
XX	QY	841	TCTACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	900
XX	DB	841	AGTACATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG	900

QY	901	GCTGCTACCTGGCTAAGCAGTGTAAACATCGCTGCTGCTGCTGCTGCTGCTGCT	960
DB	901	CCGCTACTTTTAGCCAAATAATGTAATTTGCAATGCTGCTGCTGCTGCTGCTGCT	960
QY	961	GGAGTACCAACTACGTTGATCTCCACAGCAGGAGTGTGCTGCTGCTGCTGCTGCT	1020
DB	961	GGAGCACTAATATGTAATATTAATAACAGATGCTGCTGCTGCTGCTGCTGCTGCT	1020
QY	1021	TTGACGCAAAACACTTCCAGCTGGGATCTTCTGCTGCTGCTGCTGCTGCTGCTGCT	1080
DB	1021	TTTGTATGTAATATTTCTAGCAGGAGTAGTAGATGCAAGCATGCTCCAGCAATAA	1080
QY	1081	GTGACGAGGAGTGTGGCTACCGCTGGAGGAACCCCTACCTGCTGCTGCTGCTGCTG	1140
DB	1081	GTTTAAGGCGCTGTAGCAACTGCAGGTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1140
QY	1141	GAGTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1200
DB	1141	GAATGCCCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1200
QY	1201	TCTGAGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1260
DB	1201	TCTGATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1260
QY	1261	GGAATCGACACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1320
DB	1261	GATTTGATACATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1320
QY	1321	CCTGAGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1380
DB	1321	CCGTAATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1380
QY	1381	CTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1397
DB	1381	TTATTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1397

RESULT 7  
AAA97075  
ID AAA97075 standard; DNA; 138 BP.  
XX  
AC AAA97075;  
XX  
DT 18-DEC-2000 (first entry)  
XX  
DE G5 synthetic gene synthesis primer 3205.  
XX  
KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;  
KW white spot disease; freshwater fish; immune response; infection control;  
KW PCR primer; ss.  
XX  
OS Synthetic.  
XX  
FN WO200046373-Al.  
XX  
PD 10-AUG-2000.  
XX  
PF 04-FEB-2000; 2000WO-US02962.  
XX  
PR 04-FEB-1999; 99US-0118634.  
PR 02-MAR-1999; 99US-0122372.  
PR 17-MAR-1999; 99US-0124905.  
PR 27-APR-1999; 99US-0131121.  
XX  
PA (UYGE-) UNIV GEORGIA RES FOUND INC.  
PA (CORR ) CORNELL RES FOUND INC.  
PA (CLAR/) CLARK T G.  
PA (DICK/) DICKERSON H W.  
PA (LINT/) LIN T.  
XX  
PI Clark TG, Dickerson HW, Lin T;  
XX



DR WPI: 2000-506071/45.  
 XX Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
 PT multifiliis, useful for prophylaxis and treatment of Ichthyophthirius  
 PT infection in fish -  
 XX Disclosure: Figure 12; 144pp; English.  
 XX This invention relates to novel i-antigen polypeptide sequences.  
 CC I-antigens or immobilisation antigens are common to a variety of  
 CC hymenostomatid ciliates and their expression varies in response to  
 CC environmental stimuli. This invention relates to i-antigens in  
 CC Ichthyophthirius multifiliis, a protozoan which is an obligate parasite  
 CC of freshwater fish causing ichthyophthiriasis or white spot disease. The  
 CC invention includes two polypeptide and polynucleotide sequences for two  
 CC antibodies, of 48 and 55 kb. Also included in the invention are  
 CC for identifying i. multifiliis serotypes using the nucleotide sequences.  
 CC A composition (containing the i-antigen nucleotide) capable of eliciting  
 CC an immune response in fish is useful for prophylaxis, treatment or for  
 CC vaccines comprising a portion of the amplified product encoding an  
 CC antigenic i-antigen polypeptide obtained in fish. Polynucleotide or protein  
 CC preventing i. multifiliis infection in fish. Sequences AAA97036-A97042,  
 CC and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
 CC fragments identified in the invention. Sequences AAA97043-A97064  
 CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
 CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
 CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
 XX Sequence 138 BP; 30 A; 43 C; 32 G; 33 T; 0 other;

Query Match 9.8%; Score 138; DB 21; Length 138;  
 Best Local Similarity 100.0%; Pred. No. 7 5e-30;  
 Matches 138; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 QY 313 GCTACCGACTACGCTGCTATCATCACCAGTGTGTGAACCTGTCGATCAACTTCTACAAC 372  
 DB 1 GCTACCGACTACGCTGCTATCATCACCAGTGTGTGAACCTGTCGATCAACTTCTACAAC 60  
 QY 373 GAGAACGCTCTTAACCTCAACGCTGGAGCTTCTACCTGTACCGCTGTCTGTGAACCGG 432  
 DB 61 GAGAACGCTCTTAACCTCAACGCTGGAGCTTCTACCTGTACCGCTGTCTGTGAACCGG 120  
 QY 433 CTGGGAGGAGCTCTGACC 450  
 DB 121 GTGGGAGGAGCTCTGACC 138

RESULT 8  
 ID AAA97076/G  
 XX AAA97076 standard; DNA; 123 BP.  
 AC AAA97076;  
 XX  
 XX 18-DEC-2000 (first entry)  
 XX  
 XX G5 synthetic gene synthesis primer 3206.  
 XX  
 KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;  
 KW white spot disease; freshwater fish; immune response; infection control;  
 KW PCR primer; ss.  
 OS Synthetic.  
 XX  
 XX HQ200046373-A1.  
 XX  
 XX 10-AUG-2000.  
 XX  
 XX 04-FEB-2000; 2000WO-US02962.  
 XX  
 XX 04-FEB-1999; 99US-0118634.  
 PR 02-MAR-1999; 99US-0122372.  
 PR

PR 17-MAR-1999; 99US-0124905.  
 PR 27-APR-1999; 99US-0131121.  
 XX  
 XX (UYGE-) UNIV GEORGIA RES FOUND INC.  
 PA (CORR ) CORNELL RES FOUND INC.  
 PA (CLAR/) CLARK T G.  
 PA (DICK/) DICKERSON H W.  
 PA (LINT/) LIN T.  
 XX  
 PI Clark TG, Dickerson HW, Lin T;  
 XX WPI: 2000-506071/45.  
 XX Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
 PT multifiliis, useful for prophylaxis and treatment of Ichthyophthirius  
 PT infection in fish -  
 XX Disclosure: Figure 12; 144pp; English.  
 XX This invention relates to novel i-antigen polypeptide sequences.  
 CC I-antigens or immobilisation antigens are common to a variety of  
 CC hymenostomatid ciliates and their expression varies in response to  
 CC environmental stimuli. This invention relates to i-antigens in  
 CC Ichthyophthirius multifiliis, a protozoan which is an obligate parasite  
 CC of freshwater fish causing ichthyophthiriasis or white spot disease. The  
 CC invention includes two polypeptide and polynucleotide sequences for two  
 CC antibodies, of 48 and 55 kb. Also included in the invention are  
 CC for identifying i. multifiliis serotypes using the nucleotide sequences and a method  
 CC A composition (containing the i-antigen nucleotide) capable of eliciting  
 CC an immune response in fish is useful for prophylaxis, treatment or for  
 CC vaccines comprising a portion of the amplified product encoding an  
 CC antigenic i-antigen polypeptide obtained in fish. Polynucleotide or protein  
 CC preventing i. multifiliis infection in fish. Sequences AAA97036-A97042,  
 CC and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
 CC fragments identified in the invention. Sequences AAA97043-A97064  
 CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
 CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
 CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
 XX Sequence 123 BP; 25 A; 37 C; 39 G; 22 T; 0 other;

Query Match 8.8%; Score 123; DB 21; Length 123;  
 Best Local Similarity 100.0%; Pred. No. 1.5e-25;  
 Matches 123; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 QY 430 CGCGTGGGAGGAGCTCTGACCGCTGGAAACGCTGCTACCATCGTGGCTCAGTGTAAACGTG 489  
 DB 123 CGCGTGGGAGGAGCTCTGACCGCTGGAAACGCTGCTACCATCGTGGCTCAGTGTAAACGTG 64  
 QY 490 GCTTGTCTCTACCGGAACCGCTCTGGACGACGGAGTGAACCGAGTGTACCGCTCTTTC 549  
 DB 63 GCTTGTCTCTACCGGAACCGCTCTGGACGACGGAGTGAACCGAGTGTACCGCTCTTTC 4  
 QY 550 ACC 552  
 DB 3 ACC 1

RESULT 9  
 ID AAA97071  
 XX AAA97071 standard; DNA; 117 BP.  
 AC AAA97071;  
 XX  
 XX 18-DEC-2000 (first entry)  
 XX  
 XX G5 synthetic gene synthesis primer 3201.  
 XX  
 KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;  
 KW white spot disease; freshwater fish; immune response; infection control;  
 KW PCR primer; ss.

XX OS Synthetic.  
XX PN WO200046373-A1.  
XX PD 10-AUG-2000.  
XX PF 04-FEB-2000; 2000WO-US02962.  
XX PR 04-FEB-1999; 99US-0118634.  
XX PR 02-MAR-1999; 99US-0122372.  
XX PR 17-MAR-1999; 99US-0124905.  
XX PR 27-APR-1999; 99US-0131121.  
XX XX (UYGE-) UNIV GEORGIA RES FOUND INC.  
XX PA (CORR ) CORNELL RES FOUND INC.  
XX PA (CLAR/) CLARK T G.  
XX PA (DICK/) DICKERSON H W.  
XX PA (LINT/) LIN T.  
XX PI Clark TG, Dickerson HW, Lin T;  
XX XX WPI; 2000-506071/45.  
XX DR Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
XX PT multifiliis, useful for prophylaxis and treatment of Ichthyophthirius  
XX PT infection in fish -  
XX XX Disclosure; Figure 12; 144pp; English.  
XX CC This invention relates to novel i-antigen polypeptide sequences.  
XX CC I-antigens or immobilisation antigens are common to a variety of  
XX CC hymenostomatid ciliates and their expression varies in response to  
XX CC environmental stimuli. This invention relates to i-antigens in  
XX CC Ichthyophthirius multifiliis, a protozoan which is an obligate parasite  
XX CC of freshwater fish causing ichthyophthiriasis or white spot disease. The  
XX CC invention includes two polypeptide and polynucleotide sequences for two  
XX CC i-antigens, of 48 and 55 kD. Also included in the invention are  
XX CC antibodies capable of binding to the nucleotide sequences and a method  
XX CC for identifying I. multifiliis serotypes using the nucleotide sequences.  
XX CC A composition (containing the i-antigen nucleotide) capable of eliciting  
XX CC an immune response in fish is useful for prophylaxis, treatment or for  
XX CC vaccines comprising a portion of the amplified product encoding an  
XX CC antigenic i-antigen polypeptide obtained in fish. Polynucleotide or protein  
XX CC fragments identified in the invention. Sequences AAA97043-A97064  
XX CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
XX CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
XX CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
XX XX Sequence 117 BP; 34 A; 30 C; 26 G; 27 T; 0 other;  
XX XX Query Match 7.5%; Score 105; DB 21; Length 117;  
XX XX Best Local Similarity 100.0%; Pred. No. 2.4e-20;  
XX XX Matches 105; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 1 ATGAGAACACATCCTGGTGATCCTCATCATCTCTCTGTTTCATCAACACGATCAAGTCT 60  
DB 13 ATGAAGAACACATCCTGGTGATCCTCATCATCTCTCTGTTTCATCAACACGATCAAGTCT 72  
QY 61 GCTAACTGCTCTGTGGGAACCGAGACCAACACCGCTGGACAGGTG 105  
DB 73 GCTAACTGCTCTGTGGGAACCGAGACCAACACCGCTGGACAGGTG 117  
RESULT 10  
AAA97072/c  
ID AAA97072 standard; DNA; 104 BP.  
XX AC AAA97072;  
XX XX

DT 18-DEC-2000 (first entry)  
XX G5 synthetic gene synthesis primer 3202.  
DE Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;  
XX white spot disease; freshwater fish; immune response; infection control;  
KW PCR primer; ss.  
KW Synthetic.  
OS WO200046373-A1.  
XX PN 10-AUG-2000.  
XX PD 04-FEB-2000; 2000WO-US02962.  
XX PF 04-FEB-1999; 99US-0118634.  
XX PR 02-MAR-1999; 99US-0122372.  
XX PR 17-MAR-1999; 99US-0124905.  
XX PR 27-APR-1999; 99US-0131121.  
XX XX (UYGE-) UNIV GEORGIA RES FOUND INC.  
XX PA (CORR ) CORNELL RES FOUND INC.  
XX PA (CLAR/) CLARK T G.  
XX PA (DICK/) DICKERSON H W.  
XX PA (LINT/) LIN T.  
XX PI Clark TG, Dickerson HW, Lin T;  
XX XX WPI; 2000-506071/45.  
XX DR Novel i-antigen polypeptides and polynucleotides from Ichthyophthirius  
XX PT multifiliis, useful for prophylaxis and treatment of Ichthyophthirius  
XX PT infection in fish -  
XX XX Disclosure; Figure 12; 144pp; English.  
XX CC This invention relates to novel i-antigen polypeptide sequences.  
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XX CC Ichthyophthirius multifiliis, a protozoan which is an obligate parasite  
XX CC of freshwater fish causing ichthyophthiriasis or white spot disease. The  
XX CC invention includes two polypeptide and polynucleotide sequences for two  
XX CC i-antigens, of 48 and 55 kD. Also included in the invention are  
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XX CC an immune response in fish is useful for prophylaxis, treatment or for  
XX CC vaccines comprising a portion of the amplified product encoding an  
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XX CC fragments identified in the invention. Sequences AAA97043-A97064  
XX CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
XX CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
XX CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
XX XX Sequence 104 BP; 21 A; 27 C; 30 G; 26 T; 0 other;  
XX XX Query Match 7.4%; Score 104; DB 21; Length 104;  
XX XX Best Local Similarity 100.0%; Pred. No. 4.4e-20;  
XX XX Matches 104; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 84 GACCAACACCGCTGGACAGGTGGACACCTGGGAAACCCCTGCTTAACCTGTGTGAACGTGCA 143  
DB 104 GACCAACACCGCTGGACAGGTGGACACCTGGGAAACCCCTGCTTAACCTGTGTGAACGTGCA 45  
QY 144 GAAGAACCTTCTACTACAAACACCGCTGCTGCTTTCGCTGGAG 187  
DB 44 GAAGAACCTTCTACTACAAACACCGCTGCTGCTTTCGCTGGAG 1

RESULT 11  
 ID AAA97073  
 XX AAA97073 standard; DNA; 100 BP.  
 AC AAA97073;  
 XX  
 DT 18-DEC-2000 (first entry)  
 XX  
 DE G5 synthetic gene synthesis primer 3203.  
 XX  
 KW Immobilisation antigen; i-antigen; Ichthyophthiriasis; vaccine;  
 KW white spot disease; freshwater fish; immune response; infection control;  
 KW PCR primer; ss.  
 XX  
 OS Synthetic.  
 XX  
 PN WO2000046373-A1.  
 XX  
 PD 10-AUG-2000.  
 XX  
 PF 04-FEB-2000; 2000WO-US02962.  
 XX  
 PR 04-FEB-1999; 99US-0118634.  
 PR 02-MAR-1999; 99US-0122372.  
 PR 17-MAR-1999; 99US-0124905.  
 PR 27-APR-1999; 99US-0131121.  
 XX  
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 XX  
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 DR WPI; 2000-506071/45.  
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 CC and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
 CC fragments identified in the invention. Sequences AAA97043-A97064  
 CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
 CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
 CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
 XX  
 SQ Sequence 100 BP; 16 A; 35 C; 24 G; 25 T; 0 other;  
 Query Match 7.1%; Score 100; DB 21; Length 100;  
 Best Local Similarity 100.0%; Pred. No. 6.2e-19;  
 Matches 100; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Db 1 CGCTGCTGCTTTGCTGCTGGAGCTTCTACCTGTACCCCTTCTCAGAGAGGAGCGC 60  
 QY 225 TGGAGCTCAGCCTAACCCCTCCTGCTACCGCTAACCTGGTG 264  
 Db 61 TGGAGCTCAGCCTAACCCCTCCTGCTACCGCTAACCTGGTG 100  
 RESULT 12  
 AAA97080/C  
 ID AAA97080 standard; DNA; 100 BP.  
 XX  
 AC AAA97080;  
 XX  
 DT 18-DEC-2000 (first entry)  
 XX  
 DE G5 synthetic gene synthesis primer 3210.  
 XX  
 KW Immobilisation antigen; i-antigen; Ichthyophthiriasis; vaccine;  
 KW white spot disease; freshwater fish; immune response; infection control;  
 KW PCR primer; ss.  
 XX  
 OS Synthetic.  
 XX  
 PN WO2000046373-A1.  
 XX  
 PD 10-AUG-2000.  
 XX  
 PF 04-FEB-2000; 2000WO-US02962.  
 XX  
 PR 04-FEB-1999; 99US-0118634.  
 PR 02-MAR-1999; 99US-0122372.  
 PR 17-MAR-1999; 99US-0124905.  
 PR 27-APR-1999; 99US-0131121.  
 XX  
 PA (UYGE-) UNIV GEORGIA RES FOUND INC.  
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 PI Clark TG, Dickerson HW, Lin T;  
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 CC and AAA97060, AAA97065 and AAA97089 represent i-antigen genes and gene  
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 CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the  
 CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and  
 CC AAB25893-B25906 represent i-antigen protein and peptide sequences.  
 XX

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SQ Sequence 100 BP; 22 A; 17 C; 32 G; 29 T; 0 other;
Query Match 7.1%; Score 100; DB 21; Length 100;
Best Local Similarity 100.0%; Pred. No. 6.2e-19;
Matches 100; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 753 GAACAACGGGTGGCTCAGAACACCGAGTGATACCAACTGCTCTTAACCTTCTACACAA 812
DB 100 GAACAACGGGTGGCTCAGAACACCGAGTGATACCAACTGCTCTTAACCTTCTACACAA 41

QY 813 CAACGCTCTTAACCTTCAACCTGGAACCTCTACCTGCTG 852
DB 40 CAACGCTCTTAACCTTCAACCTGGAACCTCTACCTGCTG 1

RESULT 13
AAA97077
ID AAA97077 standard; DNA; 99 BP.
XX
AC AAA97077;
XX
XX 18-DEC-2000 (first entry)
XX
DE G5 synthetic gene synthesis primer 3207.
XX
KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;
KW white spot disease; freshwater fish; immune response; infection control;
KW PCR primer; ss.
XX
OS Synthetic.
XX
XX WO200046373-A1.
XX
XX 10-AUG-2000.
XX
XX 04-FEB-2000; 2000WO-US02962.
XX
XX 04-FEB-1999; 99US-0118634.
XX
XX 02-MAR-1999; 99US-0122372.
XX
XX 17-MAR-1999; 99US-0124905.
XX
XX 27-APR-1999; 99US-0131121.
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XX (UYGE-) UNIV GEORGIA RES FOUND INC.
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XX Clark TG, Dickerson HW, Lin T;
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XX WPT; 2000-506071/45.
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CC fragments identified in the invention. Sequences AAA97043-A97064
CC (excluding AAA97060) and AAA97071-A97088 represent primers used in the
CC isolation of the i-antigen gene sequences. Sequences AAB25859-B25889 and
CC AAB25893-B25906 represent i-antigen protein and peptide sequences.
XX
XX Sequence 99 BP; 27 A; 29 C; 21 G; 22 T; 0 other;
Query Match 7.1%; Score 99; DB 21; Length 99;
Best Local Similarity 100.0%; Pred. No. 1.2e-18;
Matches 99; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 532 GACTACGTGCGCTCTTTCCACCGAGTGTGTGAAGTGTGCGCTGAACCTTCTACTACAACGGA 591
DB 1 GACTACGTGCGCTCTTTCCACCGAGTGTGTGAAGTGTGCGCTGAACCTTCTACTACAACGGA 60

QY 592 AACAAACGGAACACACCCCTTTCAACCCCTGGAAAGTCTCAG 630
DB 61 AACAAACGGAACACACCCCTTTCAACCCCTGGAAAGTCTCAG 99

RESULT 14
AAA97074/c
ID AAA97074 standard; DNA; 95 BP.
XX
XX AAA97074;
XX
XX 18-DEC-2000 (first entry)
XX
XX G5 synthetic gene synthesis primer 3204.
XX
DE Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;
KW white spot disease; freshwater fish; immune response; infection control;
KW PCR primer; ss.
XX
OS Synthetic.
XX
XX WO200046373-A1.
XX
XX 10-AUG-2000.
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XX  
SQ Sequence 95 BP; 22 A; 24 C; 30 G; 19 T; 0 other;

Query Match 6.8%; Score 95; DB 21; Length 95;  
Best Local Similarity 100.0%; Pred. No. 1.7e-17;  
Matches 95; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 242 CTCCTGCTACCGCTAACCTGGTGACCCAGTGTAAAGTGTCTGCTGGAACCGCTA 301  
DB 95 CTCCTGCTACCGCTAACCTGGTGACCCAGTGTAAAGTGTCTGCTGGAACCGCTA 36  
QY 302 TCGCTGGAGAGCTACCGACTACGCTGCTATCATC 336  
DB 35 TCGCTGGAGAGCTACCGACTACGCTGCTATCATC 1

RESULT 15  
AAA97078/c  
ID AAA97078 standard; DNA; 95 BP.  
XX  
AC AAA97078;  
XX  
DT 18-DEC-2000 (first entry)  
XX  
DE G5 synthetic gene synthesis primer 3208.  
XX  
KW Immobilisation antigen; i-antigen; ichthyophthiriasis; vaccine;  
KW white spot disease; freshwater fish; immune response; infection control;  
KW PCR primer; ss.  
XX  
OS Synthetic.  
XX  
PN WO200046373-A1.  
XX  
PD 10-AUG-2000.  
XX  
PF 04-FEB-2000; 2000WO-US02962.  
XX  
PR 04-FEB-1999; 99US-0118634.  
PR 02-MAR-1999; 99US-0122372.  
PR 17-MAR-1999; 99US-0124905.  
PR 27-APR-1999; 99US-0131121.  
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SQ Sequence 95 BP; 22 A; 19 C; 33 G; 21 T; 0 other;

Query Match 6.8%; Score 95; DB 21; Length 95;  
Best Local Similarity 100.0%; Pred. No. 1.7e-17;  
Matches 95; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 607 CCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTGTCTGCTATCAAGCCTGCTAAGCTG 666  
DB 95 CCTTTCAACCCCTGGAAAGTCTCAGTGTACCCCTTGTCTGCTATCAAGCCTGCTAAGCTG 36  
QY 667 GCTCAGGCTACCTGGGAAACGACGCTACCATCAC 701  
DB 35 GCTCAGGCTACCTGGGAAACGACGCTACCATCAC 1

Search completed: February 16, 2003, 17:00:27  
Job time : 221.022 secs

